

A2T Review for Q1 Exam 3 Answer Key

$$1) x^4 - 16y^4$$

$$(x^2 + 4y^2)(x^2 - 4y^2)$$

$$(x^2 + 4y^2)(x + 2y)(x - 2y)$$

B

$$2) x^3 + 27 \quad \text{SOAP}$$

$$(x + 3)(x^2 - 3x + 9)$$

A

$$3) 7cd^2e - 14de$$

$$7de(cd - 2)$$

B

$$4) 3x^2 + 7x - 20$$

$$3x^2 - 5x \mid +12x - 20$$

$$x(3x - 5) \mid +4(3x - 5)$$

$$(3x - 5)(x + 4)$$

C

$$ac = -60$$

-1	60
-2	30
-3	20
-4	15
-5	12

$$5) ax - ay \mid -bx + by$$

$$a(x - y) \mid -b(x - y)$$

$$(x - y)(a - b)$$

$$6) 6b^2 - b - 12$$

$$6b^2 - 9b \mid +8b - 12$$

$$3b(2b - 3) \mid +4(2b - 3)$$

$$(2b - 3)(3b + 4)$$

$$ac = -72$$

-1	72
-2	36
-3	24
-4	18
-6	12
-8	9
-9	8

$$7) 64x^3 + 1$$

$$\sqrt[3]{64x^3} = 4x \quad (4x + 1)((4x)^2 - (4x)(1) + 1^2)$$

$$\sqrt[3]{1} = 1 \quad (4x + 1)(16x^2 - 4x + 1)$$

$$8) x^2 - 9 \neq 0$$

$$(x + 3)(x - 3) \neq 0$$

$$x \neq -3 \quad x \neq 3$$

D

$$9) 21x^2 - 7x \neq 0$$

$$7x(3x - 1) \neq 0$$

$7x \neq 0$	$3x - 1 \neq 0$
$x \neq 0$	$x \neq \frac{1}{3}$

$$10) \frac{x^2 - x - 2}{x^2 - 4} = \frac{(x - 2)(x + 1)}{(x - 2)(x + 2)} = \frac{x + 1}{x + 2}$$

A

$$11) \frac{2x+x^2}{x^2+5x+6} = \frac{x(2+x)}{(x+2)(x+3)} = \frac{x}{x+3} \quad \boxed{C}$$

$$12) \frac{m^3-8}{m-2} = \frac{(m-2)(m^2+2m+4)}{(m-2)} = \boxed{m^2+2m+4} \quad m \neq 2$$

$$13) \frac{x^2-4x-12}{x^2-4} \cdot \frac{1}{x-6} = \frac{(x-6)(x+2)}{(x-2)(x+2)} \cdot \frac{1}{(x-6)} = \boxed{\frac{1}{x-2}} \quad \textcircled{A}$$

$$14) \frac{x}{3x+15} \cdot \frac{2x^2+11x+5}{2x^2+x} = \frac{x}{3(x+5)} \cdot \frac{(2x+1)(x+5)}{x(2x+1)} = \boxed{\frac{1}{3}} \quad x \neq -5, 0, \frac{1}{2}$$

$$15) \frac{2x^2+2x-24}{4x^2+x} \cdot \frac{x^2+x-6}{x+4} \cdot \frac{8x^2+2x}{x^2-9} = \frac{2(x+4)(x-3)}{x(4x+1)} \cdot \frac{(x+3)(x-2)}{x+4} \cdot \frac{2x(4x+1)}{(x+3)(x-3)} \\ = 2(x-2)(2) = 4(x-2) = \boxed{4x-8}$$

$$16) \frac{18y^{12}-9y^6+3y^3}{3y^3} = \frac{3y^3(6y^9-3y^3+1)}{3y^3} = 6y^9-3y^3+1 \quad \boxed{D}$$

$$17) \frac{a^2-16b^2}{2a-8b} \div \frac{4a+16b}{8a+24b} = \frac{(a+4b)(a-4b)}{2(a-4b)} \cdot \frac{8(a+3b)}{4(a+4b)} = \boxed{a+3b} \quad \begin{matrix} a \neq 4b \\ a \neq -4b \\ a \neq -3b \end{matrix}$$

$$18) \frac{x^2-3x}{2x^2+x-6} \div \frac{x^2-5x+6}{x^2-4} = \frac{x(x-3)}{(x+2)(2x-3)} \cdot \frac{(x-2)(x+2)}{(x-3)(x-2)} = \boxed{\frac{x}{2x-3}} \quad x \neq -2, \frac{3}{2}, 3, 2$$

$2x^2+4x-3x-6$
 $2x(x+2)-3(x+2)$
 $(x+2)(2x-3)$

$$h \neq 4, -4$$

$$\frac{LCD:}{(h+4)(h-4)}$$

$$19) \frac{h-20}{h^2-16} + \frac{2(h+4)}{h-4(h+4)} = \frac{h-20}{(h+4)(h-4)} + \frac{2h+8}{(h-4)(h+4)} = \frac{3h-12}{(h+4)(h-4)} = \frac{3(h-4)}{(h+4)(h-4)} = \boxed{\frac{3}{h+4}}$$

$$\frac{LCD:}{x(x-3)}$$

$$20) \frac{5(x)}{x-3(x)} - \frac{1(x-3)}{x(x-3)} = \frac{5x}{x(x-3)} \oplus \frac{-x+3}{x(x-3)} = \boxed{\frac{4x+3}{x(x-3)}} \quad x \neq 0, 3$$

$$21) \frac{x^2-9}{x^2-5x} \cdot \frac{5x-x^2}{x^2-x-12} \cdot \frac{x-4}{x^2-8x+16} = \frac{(x-3)(x+3)}{x(x-5)} \cdot \frac{x(5-x)}{(x-4)(x+3)} \cdot \frac{(x-4)(x-4)}{x-4} \quad x \neq 0, 5, 4, -3$$

$$= \boxed{-1(x-3)}$$

$$22) (\sqrt{x^2-5x+5})^2 = (1)^2$$

$$x^2-5x+5=1$$

$$x^2-5x+4=0$$

$$(x-4)(x-1)$$

$$x=4 \mid x=1$$

A

$$\text{Check: } x=4$$

$$\sqrt{4^2-5(4)+5}=1$$

$$\sqrt{1}=1$$

$$1=1 \checkmark$$

$$\text{Check } x=1$$

$$\sqrt{1^2-5(1)+5}=1$$

$$\sqrt{1}=1$$

$$1=1 \checkmark$$

$$23) \sqrt{x+11} + 1 = x$$

$$(\sqrt{x+11})^2 = (x-1)^2$$

$$x+11 = x^2-2x+1$$

$$0 = x^2-3x-10$$

$$(x-5)(x+2)$$

$$\boxed{x=5} \mid x=-2$$

D

$$\text{Check } x=5$$

$$\sqrt{5+11} + 1 = 5$$

$$\sqrt{16} + 1 = 5$$

$$4 + 1 = 5$$

$$5=5 \checkmark$$

$$\text{Check } x=-2$$

$$\sqrt{-2+11} + 1 = -2$$

$$\sqrt{9} + 1 = -2$$

$$3 + 1 = -2$$

$$4 = -2$$

No!

$$24) \sqrt{7x-3} + 3 = 2x$$

$$(\sqrt{7x-3})^2 = (2x-3)^2$$

$$\begin{array}{r} 7x-3 \\ -7x+3 \hline \end{array} = \begin{array}{r} 4x^2-12x+9 \\ -7x+3 \hline \end{array}$$

ac = 48

$$0 = 4x^2 - 19x + 12$$

$$4x^2 - 16x - 3x + 12$$

$$4x(x-4) - 3(x-4)$$

$$(4x-3)(x-4)$$

$$x = \frac{3}{4} \quad \boxed{x=4}$$

Check: $x = \frac{3}{4}$

$$\sqrt{7(\frac{3}{4})-3} + 3 = 2(\frac{3}{4})$$

$$\sqrt{\frac{21}{4}-\frac{12}{4}} + 3 = \frac{6}{4}$$

$$\sqrt{\frac{9}{4}} + 3 = \frac{3}{2}$$

$$\frac{3}{2} + 3 = \frac{3}{2}$$

No

Check:

$$x=4$$

$$\sqrt{7(4)-3} + 3 = 2(4)$$

$$\sqrt{25} + 3 = 8$$

$$5 + 3 = 8$$

$$8 = 8 \checkmark$$

$$25) 16^{-\frac{3}{2}} = \left(\frac{1}{16}\right)^{\frac{3}{2}} = \frac{(\sqrt{1})^3}{(\sqrt{16})^3} = \boxed{\frac{1}{64}}$$

$$26) 3(27)^{\frac{2}{3}} - 3(27)^0$$

$$3(9) - 3(1) = 27-3$$

$$\boxed{24}$$

$$27) \frac{2x^{\frac{5}{2}}}{2} = \frac{32}{2} = 16$$

$$x^{\frac{5}{2}(\frac{2}{5})} = 16^{\frac{2}{5}(\frac{5}{2})}$$

odd over even needs the \pm

$$x = 16^{\frac{1}{2}} = \pm 1024$$

$$28) b^{\frac{3}{2}(\frac{2}{3})} = 8^{\frac{2}{3}(\frac{3}{2})}$$

$$\boxed{b=4}$$

$$29) 16^{(x+2)} = 8^{(-x)}$$

$$(2^4)^{(x+2)} = (2^3)^{(-x)}$$

$$2^{4x+8} = 2^{-3x}$$

$$\begin{array}{r} 4x+8 = -3x \\ +3x \quad +3x \hline \end{array}$$

$$\begin{array}{r} 7x+8 = 0 \\ -8 \quad -8 \hline \end{array}$$

$$\frac{7x}{7} = \frac{-8}{7}$$

$$\textcircled{C} \quad x = -\frac{8}{7}$$

$$30) \sqrt{-8} + 2\sqrt{-50}$$

$$\sqrt{-4} \sqrt{2} + 2\sqrt{-25} \sqrt{2}$$

$$2i\sqrt{2} + 2 \cdot 5i\sqrt{2}$$

$$2i\sqrt{2} + 10i\sqrt{2} = \boxed{12i\sqrt{2}}$$